



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Shusaku Mandai et al.

Group Art Unit: 1774

Serial Number: 10/783,947

Examiner: SCHWARTZ, PAMELA R

Filed: February 20, 2004

For: RECORDING MEDIUM

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Hiroyuki Ono residing at Sin-ashiya-simo 15-10-123,  
Suita-shi, Osaka , Japan duly deposes and says:

1. That he graduated from Department of Hydrocarbon Chemistry, Faculty of Engineering, Kyoto University, Kyoto, Japan, in the year 1990, and he received the degree of Master of Engineering from Kyoto University Graduate School, Kyoto, Japan in the year 1992;

2. That since 1997, he has been employed in the capacity of Nippon Synthetic Chemical Industry Co., Ltd.

3. That from 1998 he has been engaged in research and development of polyvinylalcohol;

4. That he has read and is familiar with the instant application for United States Letters Patent and Office Action thereto mailed December 21, 2005;

5. That he has made experiments in order to prove that the membrane-formability become poor and many cracks occur on the

surface by using a zirconium compound and a colloidal silica ; and

6. Experiments were carried out by the following procedure.

### **Experiment**

(Experiment 1 of the instant application)

100 parts of AAPVA (A), which has a hydrolysis degree of 97.9 % by mol and an average polymerization degree of 2300 and contains 4.8 % by mol of acetoacetic ester groups, was dissolved in 2400 parts of water and 333 parts of inorganic powder (C) ("Finesil" available from Tokuyama Corporation, amorphous synthetic silica, shape: sphere, average particle size: 5  $\mu$ m) was added thereto. The solution was mixed by stirring with a homogenizer. Then, 50 parts of an aqueous solution containing 5 parts of zirconyl hydroxychloride (B) and 100 parts of a polyamine fixing agent ("Sumirez Resin 1001" available from Sumitomo Chemical Co., Ltd.) was added and the solution was mixed to obtain the coating solution (aqueous dispersion).

Then, the obtained coating solution was applied on woodfree paper with a basic weight of 64 g/m<sup>2</sup> using a 75  $\mu$ m applicator so as to become 13 g/m<sup>2</sup> converted to solid content. Then, drying was conducted in a hot air dryer at 105°C for 10 minutes to form the ink receiving layer and the recording medium for ink jet printing was obtained.

The obtained recording medium for ink jet printing is excellent in the membrane-formability and has no cracks on the surface. Also, as shown in Table 1 of the instant application, the recording medium of Example 1 is excellent in Peeling Strength,

Blurring and water resistance.

(Experiment 2)

The recording medium for ink jet printing was prepared in the same manner as in Example 1 except that inorganic powder (C) ("AS-40" available from Grace Davidson, colloidal silica, shape: sphere, average particle size: 22 nm) was used as inorganic powder (C).

The obtained recording medium for ink jet printing is poor in the membrane-formability and has many cracks on the surface.

## **Result and Discussion**

As evident from the above results, the recording medium which has a coating layer comprising the zirconium compound and the colloidal silica is poor in the membrane-formability and has many cracks on the surface. On the other hand, the recording medium of the present invention is excellent in the membrane-formability and has no cracks on the surface by using the amorphous synthetic silica.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

This 4th day of April, 2006

by Hiroyuki Ono  
Hiroyuki Ono

We, the undersigned witnesses, hereby acknowledge that Hiroyuki Ono is personally known to us and did execute the foregoing Declaration in our presence on:

Date: April 4, 2006

Witness Yoshiaki Horai

Date: April 4, 2006

Witness Shinji Kashiwagi